

REMARKS/ARGUMENTS

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(1) rejected claims 19 and 67-83 under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (U.S. Patent 5,556,501) in view of DeOrnellas et al. (WO99/25568);

(2) rejected claims 19 and 67-83 under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (U.S. Patent 5,556,501) in view of Keizo (JP07-130712A);

(3) rejected claims 19, 67, 69-70, 72-78, and 80-83 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of DeOrnellas et al. (WO99/25568);

(4) rejected claims 68, 71, and 79 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of DeOrnellas et al. (WO99/25568) as applied to claims 19, 67, 69-70, 72-78, and 80-83 above, and further in view of Collins et al. (U.S. Patent 5,556,501);

(5) rejected claims 19, 67, 69-70, 72-78, and 80-83 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of Keizo (JP07-130712A);

(6) rejected claims 68, 71, and 79 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of Keizo (JP07-130712A) as applied to claims 19, 67, 69-70, 72-78, and 80-83 above, and further in view of Collins et al. (U.S. Patent 5,556,501).

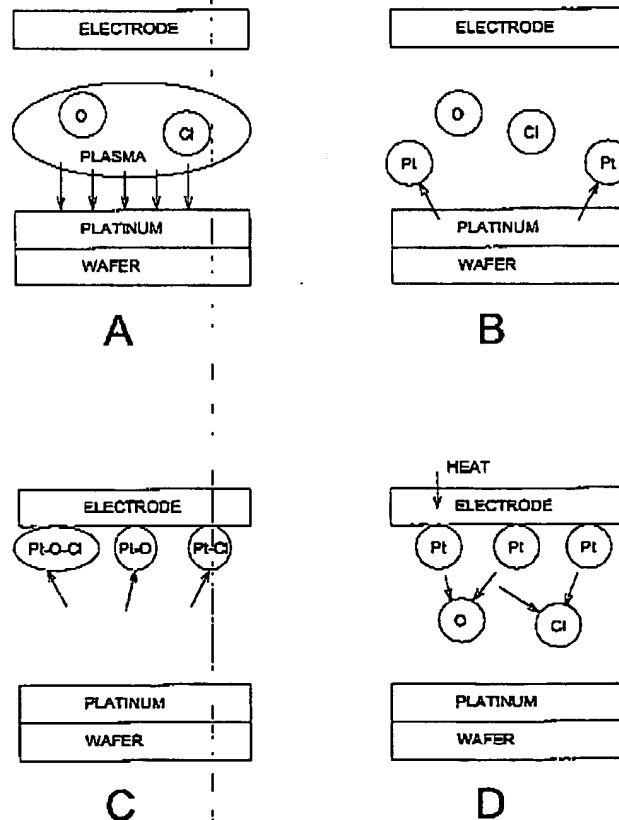
(1) With regard to the rejection of claims 19 and 67-83 under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (U.S. Patent 5,556,501) in view of DeOrnellas et al. (WO99/25568), applicant submits that the basics of the present application is the *heating of the electrode to a temperature high enough* (preferably 300 - 500°C) such that any material resulting from the reaction deposited on the surface of the electrode forms a stable film.

Thus applicant submits that the present application has an inventive concept of

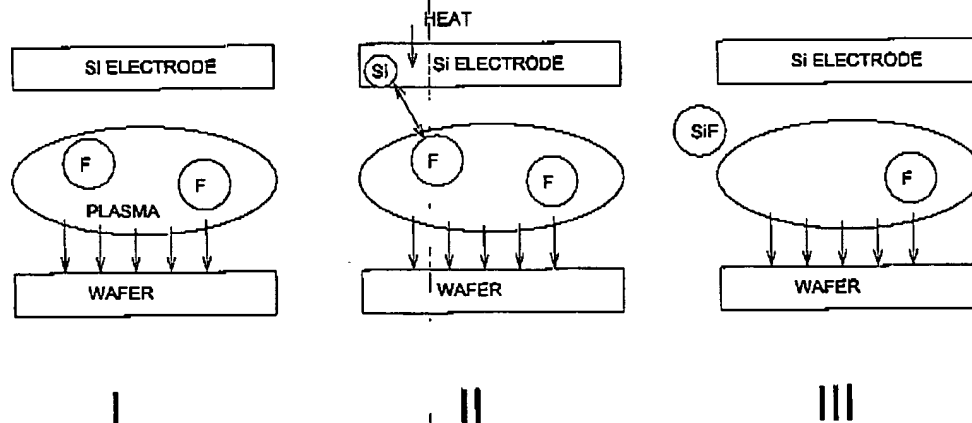
- heating the electrode to a *high enough temperature*;
and three claim limitations to support the concept of high enough temperature:

- material being *deposited* on the electrode;
- this deposited material is the *result of the etch reaction*; and
- *partially desorbing* this deposited material to form a stable film.

The following sequence A-D shows the concept of the present application. (A) An electrode forms a plasma, with the presence of oxygen and chlorine species. The plasma reacts with the platinum film on a wafer substrate. (B) Platinum etched from the wafer surface, released in the chamber. (C) Platinum, oxygen and chlorine deposit on the electrode. (D) Heating the electrode to a certain temperature desorbs oxygen and chlorine, leaving platinum deposited on the electrode.



In contrast, the disclosure of Collins et al. is a silicon scavenger process for introducing silicon from the electrode to the plasma to control the etch reaction. The following sequence I-III shows the concept of silicon scavenger, disclosed by Collins et al. (I) A silicon-containing electrode forms a plasma, with the presence of fluorine species. The plasma reacts with a wafer substrate. (II) Heating the electrode to a certain temperature improves the release of silicon from the electrode into the plasma. (III) Silicon reacts with free fluorine to create SiF, reducing the amount of free fluorine in the plasma, leading to a performance improvement.



Applicant submits that the process of silicon scavenger is well known in the art, that Collins et al. discloses a silicon scavenger process, as evidenced in the patent title "*Silicon scavenger in an inductively couple rf plasma reactor*". Further, the description on col. 22, lines 2-43 clearly describes a silicon scavenger process, disclosing "*supplying free silicon to the source plasma*" (col. 22, line 3), "*using an electrode which includes or is covered with a silicon-containing member*" (col. 22, lines 3-5), and "*the silicon enters the phase and combines with/scavenges free fluorine*" (col. 22, lines 7-9).

Thus applicant submits that Collins et al. does not teach or suggest the inventive concept, nor the above claim limitations of the present application, namely the heating of the electrode to a temperature high enough (preferably 300 - 500°C) such that any

material resulting from the reaction deposited on the surface of the electrode forms a stable film.

Applicant submits that the heated electrode disclosure of Collins et al. does not enable a person with ordinary skills in the art to discover the temperate range of the present application due to the lacking of motivation. Collins et al. discloses an electrode heating, but the *"electrode is controllably heated to increase its reactivity"* (claim 1, last 3 lines). Collins et al. does not disclose the range of temperature for the electrode heating, but his reactor has chamber wall temperature ranging from -150°C to 120°C, thus one could reasonably infer that the temperature range of reactivity increase is up to 120°C. With the objective of increasing silicon reactivity, applicant submits that it is not obvious to think about heating the electrode to the range of 300 - 500°C, which is the temperature preferred for desorption, disclosed by the present application.

With respect to the material to be released from the electrode, this material is the material of the electrode itself in Collins et al.'s disclosure *"supplying free silicon to the source plasma (using an electrode which includes or is covered with a silicon-containing member)"* (col. 22, lines 3-5). Applicant submits that Collins et al. does not teach a deposition process to the electrode, and does not teach that the material deposited on the electrode is the result of the etch reaction. Further, the released material is the electrode material, thus Collins et al. does not teach the desorption process. Thus, without the teaching of desorption process, without the disclosing of material being deposited onto the electrode, without the showing of deposited material being the result of the etch reaction, applicant submits that the temperature range disclosed by the present invention cannot be obvious.

Similarly, applicant submits that DeOrnellas only discloses a platinum etch process, without disclosing any of the other components discussed above, including the heating to a high enough temperature, the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

In sum, applicant submits that there is no suggestion nor motivation to modify the references of Collins et al. and DeOrnellas et al. to heat the electrode to a temperature

high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. Collins et al. only discloses the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

Further, both references do not teach or suggest the claim limitations of the present application of: the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

Thus applicant submits that the combination of these references would not render the present application obvious.

(2) With regard to the rejection of claims 19 and 67-83 under 35 U.S.C. 103(a) as being unpatentable over Collins et al. (U.S. Patent 5,556,501) in view of Keizo (JP07-130712A), applicant submits that Keizo discloses a platinum etch with chlorine.

The examiner provides a motivation for combining the references of Collins et al. and Keizo, which is the reduction of platinum deposits that can form on the electrode. "... *it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Collins et al. so as to performing the platinum etching process of Keizo, because this would be a suitable method, for example, to reduce the platinum deposits that can form on the ~~wafer~~ electrode.*" (Applicant respectfully assumes that the word *wafer* is a typo, and that it should be *electrode*, since the present application discloses deposition of platinum by-products on the electrode, and the heating of the electrode to desorb this deposited material from the electrode.)

Applicant submits that this motivation is improper since it is not suggested nor mentioned in these references. Further, this motivation is not in the knowledge generally available to one of ordinary skill in the art since the present application is not related to the platinum etch, but related to the long term repeatability of the platinum etch equipment, which is a special and unique knowledge.

Thus similar to the above arguments, applicant submits that there is no suggestion nor motivation to modify the references of Collins et al. and Keizo to heat the electrode to a temperature high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. The concept of silicon scavenging disclosed by Collins et al. provides the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

Further, both references do not teach or suggest the claim limitations of the present application of: the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

Thus applicant submits that the combination of these references would not render the present application obvious.

(3) With regard to the rejection of claims 19, 67, 69-70, 72-78, and 80-83 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of DeOrnellas et al. (WO99/25568), applicant submits that similar to Collins et al., Imai discloses a silicon scavenger process by introducing silicon from a silicon element onto the plasma to react with fluorine so that the fluorine can be effectively scavenged.

The examiner provides a motivation for combining the references of Imai et al. and DeOrnellas et al., which is a suitable method, for example, to reduce the platinum deposits that can form on the electrode. Applicant submits that this motivation is improper since it is not suggested nor mentioned in these references. Further, this motivation is not in the knowledge generally available to one of ordinary skill in the art since the present application is not related to the platinum etch, but related to the long term repeatability of the platinum etch equipment, which is a special and unique knowledge.

Thus similar to the above arguments, applicant submits that there is no suggestion nor motivation to modify the references of Imai et al. and DeOrnellas et al. to heat the

electrode to a temperature high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. The concept of silicon scavenging disclosed by Imai et al. provides the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

Further, both references do not teach or suggest the claim limitations of the present application of: the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

Thus applicant submits that the combination of these references would not render the present application obvious.

(4) With regard to the rejection of claims 68, 71, and 79 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of DeOrnellas et al. (WO99/25568) as applied to claims 19, 67, 69-70, 72-78, and 80-83 above, and further in view of Collins et al. (U.S. Patent 5,556,501), applicant submits that, similar to the above argument, applicant submits that all references of Imai et al., DeOrnellas et al. and also Collins et al. do not disclose the heating to a high enough temperature, the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film, and thus the combination of both these references would not render the present application obvious.

Thus similar to the above arguments, applicant submits that there is no suggestion nor motivation to modify the references of Imai et al., DeOrnellas et al. and Collins et al. to heat the electrode to a temperature high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. The concept of silicon scavenging disclosed by Collins et al. and Imai et al. provides the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

Further, both references do not teach or suggest the claim limitations of the present application of: the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

Thus applicant submits that the combination of these references would not render the present application obvious.

(5) With regard to the rejection of claims 19, 67, 69-70, 72-78, and 80-83 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of Keizo (JP07-130712A), applicant submits that, similar to the above arguments, applicant submits that both Imai et al. and Keizo do not disclose the heating to a high enough temperature, the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film, and thus the combination of both these references would not render the present application obvious.

The examiner provides a motivation for combining the references of Imai et al. and Keizo, which is a suitable method, for example, to reduce the platinum deposits that can form on the electrode. Applicant submits that this motivation is improper since it is not suggested nor mentioned in these references. Further, this motivation is not in the knowledge generally available to one of ordinary skill in the art since the present application is not related to the platinum etch, but related to the long term repeatability of the platinum etch equipment, which is a special and unique knowledge.

Thus similar to the above arguments, applicant submits that there is no suggestion nor motivation to modify the references of Imai et al. and Keizo to heat the electrode to a temperature high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. The concept of silicon scavenging disclosed by Imai et al. provides the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

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Thus applicant submits that the combination of these references would not render the present application obvious.

(6) With regard to the rejection of claims 68, 71, and 79 under 35 U.S.C. 103(a) as being unpatentable over Imai et al. (WO97/27622) in view of Keizo (JP07-130712A) as applied to claims 19, 67, 69-70, 72-78, and 80-83 above, and further in view of Collins et al. (U.S. Patent 5,556,501), applicant submits that, similar to the above argument, applicant submits that all references of Imai et al., Keizo and also Collins et al. do not disclose the heating to a high enough temperature, the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film, and thus the combination of both these references would not render the present application obvious.

Thus similar to the above arguments, applicant submits that there is no suggestion nor motivation to modify the references of Imai et al., Keizo and Collins et al. to heat the electrode to a temperature high enough for desorbing the deposited material since these references are silent regarding desorbing the deposited material. The concept of silicon scavenging disclosed by Collins et al. and Imai et al. provides the heating of the electrode for reactivity improvement, which requires a much lower temperature than the temperature range needed for desorption.

Further, both references do not teach or suggest the claim limitations of the present application of: the material being deposited onto the electrode, the deposited material being from the reaction, and the desorption of the deposited material to form a stable film.

Thus applicant submits that the combination of these references would not render the present application obvious.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Date: _____

5/1/06

Respectfully submitted,

By: _____

Sheldon R. Meyer
Reg. No. 27,660

FLIESLER MEYER LLP
Four Embarcadero Center, Fourth Floor
San Francisco, California 94111-4156
Telephone: (415) 362-3800

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